Obesity & Mental Health

An Overview

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Outline

- Association between mental illness and obesity
- Stress, biology and obesity
- Mental health contributions to treatment
- Primary care best practices

Relationship between Mental Illness and Obesity

- Adult with serious and persistent mental illness (SPMI) more likely to have obesity, heart disease and diabetes.
- Statistically increased odds of obesity in U.S. veterans with dx of any of 6 Axis I mental illnesses (Chwastiak et al., 2011)
  - Highest odds – Schizophrenia, PTSD, and Bipolar D/O
- BMI change over a 5 year period inversely associated with mental health quality of life in both Australian men and women (Cameron, et al. 2011)

Psychotropic medication

- Psychotropic medications associated with obesity and metabolic disturbance:
  - Second generation antipsychotic medication
  - Mood stablilizers (lithuim, valproate)
  - Tricyclic Antidepressants (TCAs)
    - Anticholinergic side effects
  - Selective Serotonin Reuptake Inhibitors (SSRIs)
    - Findings inconsistent
    - Generally considered “weight-neutral”

Longitudinal relationship between Mental Illness & Obesity

- Childhood depression associated with overweight & obesity
- Depressive symptoms often no different from non-overweight peers
- Symptomatology rates depend on informant and method of assessment (maternal and child report often differ)
- Prospective studies show an association between childhood depression and obesity later in life (Goodman & Whitaker, 2002).

(Blaine, 2008)

Stress, Biology and Obesity

- Hypothalamic-Pituitary-Adrenal Axis (HPA)
- Metabolic Syndrome
- Abdominal fat

- In sum:
  - HPA Axis dysregulation has been associated with:
    - Obesity, metabolic syndrome, bulemia, binge eating disorder and anorexia

Cortisol “the stress hormone”

- The principle glucocorticoid
- Secreted by the adrenal glands
- Controls the inflammatory response
- Stimulates insulin release
- stimulates gluconeogenesis (creation of glucose) to ensure an adequate fuel supply
- increases mobilization of free fatty acids, making them a more available energy source
- stimulates protein catabolism to release amino acids for use in repair, enzyme synthesis, and energy production
- acts as an anti-inflammatory agent
- depresses immune reactions
- increases the vasoconstriction caused by epinephrine

Cortisol Research Highlights

- Correlations found between Cortisol levels, BMI and waist to hip ratio. (Rosmund et al., 1998)
- Higher levels of cortisol measured in obese females who gained weight in response to a stressful event than age- and weight-matched obese or lean control females (Vicennati et al., 2009)
- Association between depression and BMI was mediated by cortisol reactivity in girls. (Dockray et al., 2009)

Leptin

- Amino Acid synthesized in adipose cells and secreted in proportion to fat mass
- Signals CNS regarding fat stores to control food intake
- Part of an asymmetric weight regulating feedback loop
  - Decreased Leptin levels from fat loss lower metabolism and reduce sensitivity to meal-ending signals, increasing caloric intake.
  - Increased Leptin levels from fat gain do not necessarily lead to appetite reduction.
- Levels show circadian rhythm and are significantly decreased by sleep deprivation
- Several studies have shown that glucocorticoid agonists modulate leptin levels

Ghrelin

- Gastric hormone produced in the stomach and pancreas
- Acts centrally to increase food intake
- Increased levels measured during sleep deprivation
- Inverse relationship with BMI
- Investigation of anti-obesity vaccine in animals
  - Problematic due to multiple roles played by ghrelin (learning & memory, tissue repair, muscle repair, bone strength, sleep duration)

Sleep loss

- Chronic, partial sleep loss likely increases the risk of obesity and weight gain.
- Results in decreased glucose tolerance
- Decreased insulin sensitivity
- Increased evening cortisol concentrations
- Increased ghrelin levels
- Decreased leptin levels
- Increase in appetite

Intervention

Intervention is Easier with Children than Adults

- Advantages to early intervention (Raynor, 2008):
  - Easier to change eating and activity behaviors in children (not as entrenched as with adults);
  - Food preferences are learned and still flexible in childhood;
  - Multiple negative ramifications of lifetime of obesity;
  - May prevent development of excess adipose cells (can't do this with adults it's too late);
  - May have better family support than obese adults;
  - Take advantage of linear growth and increases in lean muscle mass (not possible with adults, fully grown);
  - May have better long-term consistent outcomes (than adult-only intervention programs) demonstrated in 5 and 10 yr follow up studies.

Cognitive Behavioral Concepts

- Readiness for change
  - Awareness of problem
  - Commitment to change
  - Match intervention with stage of change
- Social Cognitive Theory (Bandura)
  - Self-regulatory skills
  - Self-efficacy

Transtheoretical Stages of Change Model (Prochaska, et al.)

- Precontemplation
  - No intention to change behavior in the next 6 months
- Contemplation
  - Individual is aware that a problem exists and is considering a behavior change within the next 6 months
- Preparation
  - Individual intends to take action in the next 30 days
- Action
  - Individual has initiated overt modification of the behavior within the past 6 months
- Maintenance
  - the period from 6 months to an indeterminate period past the initial action, when the individual works to prevent relapse and maintain the behavior change

Stages of Change and Interventions

Stage	Pre-contemplation	Contemplation	Preparation	Action	Maintenance	Relapse
Characteristics	Not currently considering change: "Ignorance is bliss"	Ambivalent about change: "Sitting on the fence" Not considering change within the next month	Some experience with change and are trying to change: "Testing the waters" Planning to act within 1month	Practicing new behavior for 3-6 months	Continued commitment to sustaining new behavior Post-6 months to 5 years	Resumption of old behaviors: "Fall from grace"
Techniques	Validate lack of readiness Clarify: decision is theirs Encourage re-evaluation of current behavior Encourage self-exploration, not action Explain and personalize the risk	Validate lack of readiness Clarify: decision is theirs Encourage evaluation of pros and cons of behavior change Identify and promote new, positive outcome expectations	Identify and assist in problem solving re: obstacles Help patient identify social support Verify that patient has underlying skills for behavior change Encourage	Focus on restructuring cues and social support Bolster self-efficacy for dealing with obstacles Combat feelings of loss and reiterate long-term benefits	Plan for follow-up support Reinforce internal rewards Discuss coping with relapse	Evaluate trigger for relapse Reassess motivation and barriers Plan stronger coping strategies

Social Cognitive Theory

- Elements required for changing health behavior
  - Knowledge of health risks/benefits of behaviors
  - perceived self-efficacy
  - Outcome expectations
  - Goals (& specific plans/strategies)
  - Perceived facilitators
  - Social & structural impediments
- People will not work toward a goal if they have no confidence in their ability to achieve it.
- Knowledge of risks is only a precursor for behavior change.
- Emphasis should be on skill building and increasing sense of efficacy rather than scare tactics.
- Social support is only effective to the extent that it increases self-efficacy (vice dependence)

Cognitive-Behavioral Interventions

- Self-Monitoring
  - Improving awareness of
    - Triggers for eating
    - Food choices
    - Portion sizes
- Stimulus Control
  - Changing patterns of eating
  - Keeping unhealthy food choices out of home
  - Replacing eating with healthier alternatives
  - Distraction
  - Re-enforcement
  - Rehearsal
  - Problem-solving

Cognitive-Behavioral Interventions

- Cognitive Restructuring
  - Recognizing and challenging self-defeating thinking patterns that undermine successful weight loss
  - "This is too hard. I can't do it."
  - "If I don't make it to my target weight, I've failed.“
  - "Now that I've lost weight, I can go back to eating any way I want.“
  - “I’ve broken my diet, I might as well finish this carton of ice cream.”
- Arousal Management
  - Relaxation training

Cognitive-Behavioral Interventions

- Arousal Management
  - Critical component of successful lifestyle intervention programs (Andersson et al., 2008)
  - Ex: Abdominal breathing, progressive muscle relaxation, guided imagery
  - Sympathetic Parasympathetic dominance
  - Decreased
    - Respiration rate
    - Heart rate
    - O2 consumption
    - Blood pressure

The role of exercise

- In addition to burning calories…
- Normalizes cortisol, inslulin, blood glucose, growth hormone, thyroid etc…
- May reduce Ghrelin levels
- Psychological Pathways
  - Improvements in mood may temper emotional eating
  - Annesi and Gorjala (2010) evaluated an exercise program for obesity:
    - Only 19% of mean loss in weight could be directly attributed to caloric expenditure from exercise.
    - Changes in mood disturbance scores were the only unique contributors to explained variance in BMI change.
  - Translation of self-regulatory skills and self-efficacy to controlled eating (Annesi, 2011)

Mental Health Assessment of patients for bariatric surgery

- Mental health screening is common practice
- Patients with 2 or more psychiatric diagnoses were significantly more likely to experience weight loss cessation or weight gain after 1 year post-surgery than those with 0 or 1 diagnosis (Rutledge et al., 2011).
- Dx of Binge Eating Disorder, depression, greater # of missed appointments and failure to comply with exercise program associated with poor outcome (Toussi, 2009).

Pharmacologic Intervention?

- Effect sizes for both pharm and non-pharm interventions are low to medium with non-pharm demonstrating slight superiority (Megna et al., 2011)
- Anorectics
  - Subutramine (SNRI) – withdrawn from U.S. and E.U. markets due to adverse cardiac events and stroke
  - Phentermine (amphetamine) – psychological dependence, tolerance, rebound weight gain
  - Amphepramone – (amphetamine/NRA)
- SSRI medication - Binge Eating Disorder
  - Modest effect sizes
  - Low recovery rates
  - Combination of medication and psychotherapy associated with better outcome than either alone.

Primary Care Assessment & Intervention

- Assess, educate, target:
  - Sleep deficit
  - Depression
  - Social Support
  - Psychosocial stressors
- Intervention appropriate for stage of change
- Treatment must be multidisciplinary
  - Partner with a mental health provider